

14th Biennial
State of the San Francisco Estuary Conference
 October 21-22, 2019



GREAT EGRET: VERNE NELSON

Poster Program

Table of Contents

Poster Clusters	1
<i>Elkhorn Slough Restoration Science</i>	1
<i>Revealing San Francisco Bay's Natural and Constructed Rocky Shores: Ecological Insights to Inform Nature-Based Adaptation and Restoration</i>	1
<i>Saving Salty: How Emerging Research on Salt Marsh Harvest Mouse Ecology - Beyond Habitat Preferences - Can Influence Recovery</i>	2
<i>The Native Olympia Oyster: Status, Ecology, and Restoration</i>	2
<i>The Tidal Parr Study</i>	3
General Sessions.....	3
<i>Citizen Science/Volunteer Monitoring</i>	3
<i>Climate Change</i>	3
<i>Data/Tools</i>	4
<i>Food Webs</i>	4
<i>Habitat Restoration</i>	5
<i>Invasive Species</i>	7
<i>Public Education, Outreach, and Access</i>	7
<i>Sediment</i>	8
<i>Species and Communities</i>	8
<i>Water Quality</i>	9
<i>Watershed Management</i>	11

Poster Clusters

Elkhorn Slough Restoration Science

Elkhorn Slough Restoration Science
Kerstin Wasson, Elkhorn Slough NERR

Enhancing Marsh Resilience, Blue Carbon Function and Sea Otter Habitat Through Sediment Addition
Monique Fountain, Elkhorn Slough NERR

UAV as a Tool for Elevation Monitoring at Restoration Site
Alexandra Lapidés, Elkhorn Slough NERR

Examining Drivers of Marsh Colonization at a Sediment Addition Restoration Site
Alexandra Thomsen, CSU Monterey Bay*

Testing Clustered Plantings to Improve Salt Marsh Restoration Success
Karen Tanner, UC Santa Cruz

Small-Scale Experimental Seagrass Restoration Success with Large-Scale Consequences
Kathryn Beheshti, UC Santa Cruz*

Olympia Oyster Restoration Aquaculture in a Recruitment-Limited Estuary
Kerstin Wasson, Elkhorn Slough NERR

Revealing San Francisco Bay's Natural and Constructed Rocky Shores: Ecological Insights to Inform Nature-Based Adaptation and Restoration

Revealing San Francisco Bay's Natural and Constructed Rocky Shores: Ecological Insights to Inform Nature-Based Adaptation and Restoration
Karina Nielsen, Estuary & Ocean Science Center, SFSU

The Rockweed Beds of San Francisco Bay are Habitat for Abundant Invertebrate Prey for Fishes and Birds
Byron Riggins, Estuary & Ocean Science Center, SFSU*

Distributional Limits of San Francisco Bay Rockweed Populations are Influenced by Substratum Slope and Tidal Height
Elizabeth Max, Estuary & Ocean Science Center, SFSU

Reproductive Phenology of the Rockweed, *Fucus distichus*, in San Francisco Bay
Chelsey Wegener, Estuary & Ocean Science Center, SFSU*

Saving Salty: How Emerging Research on Salt Marsh Harvest Mouse Ecology - Beyond Habitat Preferences - Can Influence Recovery

Saving Salty: How Emerging Research on Salt Marsh Harvest Mouse Ecology - Beyond Habitat Preferences - Can Influence Recovery

Katie Smith, UC Davis | WRA, Inc.

Ecological Interactions Among the Salt Marsh Harvest Mouse and Co-Occurring Species

Lydia Stroupe, CSU San Marcos

The Salt Marsh Harvest Mouse (SMHM; *Reithrodontomys raviventris*) Workgroup 2019 update: Identifying Recovery Needs and Filling Data Gaps

Isa Woo, USGS

The Ins and Outs of Parasitology in the Salt Marsh Harvest Mouse and Sympatric Rodents

Sadie Trombley, UC Davis*

Spatial and Seasonal Dietary Analysis of Salt Marsh Harvest Mouse using DNA Metabarcoding

Cody Aylward, UC Davis*

It's Getting Hot in Here: Salt Marsh Harvest Mouse Survival and Recovery after a Wildfire

Melissa Riley, CDFW | UC Davis

Salt Marsh Harvest Mouse Landscape Genetics and Connectivity within the Suisun Bay Area Recovery Unit

Mark Statham, UC Davis

What We Know About Salt Marsh Harvest Mice: New vs Historic Knowledge

Laureen Barthman-Thompson, CDFW

Guess that Mouse

Candice Rose, CDFW

The Native Olympia Oyster: Status, Ecology, and Restoration

The Native Olympia Oyster Collaborative (NOOC): Synthesizing Lessons Learned and Catalyzing Future Conservation Efforts

April Ridlon, Elkhorn Slough NERR

Ecological Interactions at an Oyster Restoration Project: San Francisco Bay Living Shorelines Project

Jeffrey Blumenthal, Estuary & Ocean Science Center, SFSU | SERC

Impacts of the Invasive Atlantic Oyster Drill on Native Oysters: A Challenge for Restoration

Chela Zabin, SERC | Estuary & Ocean Science Center, SFSU

Current Status of Olympia Oyster Populations in Northern San Francisco Bay and Responses to Environmental Drivers

Andrew Chang, SERC | Estuary & Ocean Science Center, SFSU

The Tidal Parr Study

The Tidal Parr Study Overview
Calvin Lee, ICF

Spatial and Temporal Distribution of Juvenile Salmon Rearing in Tidal Marsh of the San Francisco Estuary, CA
Jake Sousa, ICF

Efficient Monitoring of Juvenile Chinook Salmon Distribution and Habitat Use in the San Francisco Estuary Using Environmental DNA (eDNA)
Thiago Sanches, UC Davis*

Variation in Somatic Growth of Juvenile Chinook Salmon in Tidal Marsh Habitats of the San Francisco Estuary, CA
Brett Harvey, CDWR

General Sessions

Citizen Science/Volunteer Monitoring

Standardizing Creek Monitoring in Contra Costa County
Helen Fitantes, The Watershed Project

Varied Migratory Strategy and Habitat Use by Bay Area Great Egrets
David Lumpkin, Audubon Canyon Ranch

Lake Merritt Underwater Observatory
Katharine M. Noonan, Lake Merritt Institute | Lake Merritt Underwater Observatory

Lake Merritt Citizen Monitoring Study: Two Years of “Keeping an Eye on Lake Merritt”
Katharine M. Noonan, Lake Merritt Institute

Citizen Science Monitoring of Bacteria in Lake Merritt
Katharine M. Noonan, Lake Merritt Institute

Twenty Years of Student Water Quality Data to be Uploaded to Web (San Francisco Estuary Institute’s CD3 Program and FlowWest, Inc.)
Katharine M. Noonan, Lake Merritt Institute

Climate Change

Effect of Sea Level Rise on Riparian Ecosystems in the Sacramento-San Joaquin Delta
Dylan Chapple, Delta Stewardship Council

Adapting to Rising Tides, East Contra Costa County: Planning for Current and Future Flooding at the Bay-Delta Interface.
Samantha Cohen, BCDC

Nature-Based Wave Attenuation Options at Dunphy Park
Camila Fishtahler, Conservation Corps North Bay

Assessing the Vulnerability of Bay Delta Communities to Extreme Heat
Lindsay Kammeier, UC Davis*

Linking Vulnerability to Action: Developing an Equitable Approach to Multi-Benefit Adaptation Planning in the San Francisco Bay Area
Jaclyn Mandoske, BCDC

Early-Stage Outcomes at the Innovative Sears Point Tidal Marsh Restoration Project
Stuart Siegel, SF Bay NERR | Estuary & Ocean Science Center, SFSU

Refining a Marsh Sea-Level Rise Accretion Model to Incorporate Vegetation Succession and Parameter Uncertainty
Karen Thorne, USGS

Margaret A. Davidson Graduate Fellowship: A New NOAA Program to Advance Scientific Understanding and Collaboration in the National Estuarine Research Reserve (NERR) System
Michael Vasey, SF Bay NERR

Data/Tools

Common Delta Base Map: Delta Aquatic Resources Inventory (DARI)
Cristina Grosso, SFEI

Improving Water Data Accessibility and Usability Through an Integrated Data Repository and Visualization Portal
Jeffrey Hansen, USGS

New Resources Supporting Adaptive Management in the Delta: Compilations of Conceptual Models, Uncertainties, and Monitoring Protocols
Annika Keeley, Delta Science Program

Sea the Future: To See Future Flooding Impacts, Find the Tool that Works for You
Brenna Mahoney, NOAA

A View into the Delta Plan Performance Measures
Scott Navarro, Delta Stewardship Council

San Francisco Bay-Delta Community Model
Kees Nederhoff, Deltares USA

New Lidar Informs Mapping in the Legal Delta and Beyond
Carol Ostergren, USGS

Starting the Path to Open Data
Jenna Rinde, CDWR

Comparison of Arduino Probe Methodology to Existing Field Methods Used for Acid Mine Drainage Research in Leona Creek, Oakland, CA
Masha Soshnin, Mills College

Building an Integrated Dataset of Zooplankton Monitoring in the San Francisco Estuary
Karen Kayfetz, Delta Science Program, Delta Stewardship Council

Incorporating Expanded Sampling into an Alternative Abundance Index for the Fall Midwater Trawl Survey
James White, CDFW

Food Webs

Impacts of Periodic Dredging on Macroinvertebrate Prey Availability for Benthic Foraging Fishes
Susan E. W. De La Cruz, USGS

Growth Rates of an Abundant Calanoid Copepod in the Yolo Bypass Floodplain
Austin Gearty, Estuary & Ocean Science Center, SFSU*

Demographic and Seasonal Variation in Biofilm Consumption by Migratory Western Sandpipers (*Calidris mauri*)
Laurie A. Hall, USGS

Now We Know that Delta Aquatic Foodwebs Benefit Significantly from Terrestrial Detrital Material - So Let's Go Find It

Peter Hernes, UC Davis

Phytoplankton Carbon Transfer Across Forty-Three Years in Upper San Francisco Estuary, California

Peggy Lehman, CDWR

Habitat Restoration

Multi-Benefit Projects are Real! Flood Protection, Sea Level Rise Resiliency, and Habitat Enhancement from the San Francisquito Creek Bay to Highway 101 Project.

Zoey Diggory, Valley Water

Morphologic Change and Legacy Mercury Remobilization in Alviso Slough, South San Francisco Bay

Amy Foxgrover, USGS

Assessing Restoration Success at the Coyote Creek Field Station, CA

Liam Healey, Santa Clara University

Wings Landing Tidal Habitat Restoration Project

Ryan Lopez, Natural Resources Group, Inc.

Habitats and Highways: Integrated Habitat Restoration and Transportation Planning in Northern San Pablo Bay

Julian Meisler, Sonoma Land Trust

Funding Science & Restoration in SF Estuary Ecosystems: An Overview of CDFW Grant Programs

Hildie Spautz, CDFW

Beneficial Use of Dredge Material in Wetland Restoration: Progress at the Cullinan Ranch Restoration Project

Natalie Washburn, Ducks Unlimited, Inc.

Habitat Restoration - Aquatic

Recycled Reefs Restore Native Oysters and Keep Defunct Crab Pots Out of Landfills

Makayla Counselman, The Wild Oyster Project

Understanding the Physical and Biological Processes that Influence Aquatic Habitat Quality for Delta Smelt and Other Imperiled Fish Populations: The Role of the Benthos 2017

Kelly Shrader, USGS

Establishing a Pre-Restoration Benthic Invertebrate Community Baseline for the Tule Red Tidal Restoration Project

Isa Woo, USGS

Understanding the Physical and Biological Processes that Influence Aquatic Habitat Quality for Delta Smelt and Other Imperiled Fish Populations: The Role of the Benthos 2018

Francis Parchaso, USGS

Understanding the Physical and Biological Processes that Influence Aquatic Habitat Quality for Delta Smelt and Other Imperiled Fish Populations: The Role of the Benthos 2016

Emily Zierdt Smith, USGS

Habitat Restoration – Avian

Restoration Success: Avian Richness and Abundance in Restored San Francisco Bay Tidal Marsh Habitat, Based on Citizen Scientist Point Count Surveys.

Daniel Edelstein, Consulting Avian Biologist

Restoring Tidal Marsh Transition Zones - Grasses for Rails?

Megan Elrod, Point Blue Conservation Science

If You Build it They Will Come: California Ridgway's Rail at North Creek Marsh Within the Eden Landing Ecological Reserve

Jeanne Hammond, SF Estuary Invasive Spartina Project | Olofson Environmental, Inc.

Canvasback Movement Patterns and Resource Selection in the San Francisco Bay Delta

Aliya McCarthy, USGS

Waterbird Response to Physical Island Characteristics at Salt Pond SF2

Stacy M. Moskal, USGS

Migration Timing and Spatial Distribution of Phalaropes in South San Francisco Bay

Max Tarjan, San Francisco Bay Bird Observatory

Habitat Restoration – The Delta

Project Support for Restoration in the Delta: Providing Resources to Promote Coordination in Restoration, Planning and Implementation

Eva Bush, Delta Science Program, Delta Stewardship Council

Utilizing a Public-Private Partnership to Restore Native Fish Habitat in the Yolo Bypass: The Yolo Flyway Farms Restoration Project

Chris Campbell, cbec ecoengineering

Assessing Terrestrial-Aquatic Connectivity and Adaptive Capacity of Delta Restoration Projects

Kaylee Griffith, Delta Stewardship Council

Delta Conservancy Proposition 1 Projects and Connections

Aaron Haiman, Sacramento-San Joaquin Delta Conservancy

Habitat Restoration – Vegetation

Living Shorelines at Giant Marsh: Early Lessons from Eelgrass Restoration

Margot Buchbinder, Estuary & Ocean Science Center, SFSU

Mix or Match? Multiple Sources of Eelgrass in Restoration May Hedge Bets in Highly Variable San Francisco Bay

Melissa Patten, Estuary & Ocean Science Center, SFSU

Scaling Volunteer Opportunities: Mobile Nursery Operations and Corporate Partnerships

Kenneth Rangel, Save The Bay

Bird Nests as Botanical Time Capsules for Lost Habitat

Alex Rinkert, San Francisco Bay Bird Observatory

Factors Affecting Endangered *Suaeda californica* Establishment and Use in High Tide Refuge in San Francisco Bay
*Kelly Santos**, *Estuary & Ocean Science Center, SFSU*

Beyond Containers: Scaling Up Native Plant Species Propagation Methods for Large Acreage Wetland Restoration Projects
Rebecca Wynd, Save The Bay

Invasive Species

Geographical Distribution and Patterns of Spread for Marine and Estuarine Non-Indigenous Species in San Francisco Bay
Karen Bigham, CDFW

Vessel Patterns in California
Lina Ceballos-Osuna, CSLC

Floods, Droughts, and Blobs: Environmental Influences on Estuarine Community Composition and Introduced Species Success
Andrew Chang, SERC

Nutria in the Delta
Aaron Haiman, Sacramento-San Joaquin Delta Conservancy

Delta Conservancy: A Partner for Invasive Species Control and Ecosystem Restoration in the Delta
Thomas Jabusch, Sacramento-San Joaquin Delta Conservancy

Effects of Climate Change on Eelgrass (*Zostera marina*) Herbivory by an Invasive Grazer in San Francisco Bay
*Christian Tettelbach**, *Estuary & Ocean Science Center, SFSU*

Public Education, Outreach, and Access

Cultivating Adult Environmental Learning: Place-Based Learning at Lake Merritt
*Carli Baker**, *Western Governors University*

Explore Alameda County Watersheds
Cynthia Butler, Alameda County RCD

The State of Bay-Delta Science: An Ongoing Effort to Synthesize and Communicate Our Knowledge of the Bay-Delta System
Maggie Christman, Delta Science Program, Delta Stewardship Council

SFEWS: Open by Design
Lauren Muscatine, UC Davis

Engaging and Empowering Stewards of the Future
GianCarlo Onorati, Save The Bay

Delta Mercury Exposure Reduction Program (MERP)
Kirt Sandhu, Sacramento-San Joaquin Delta Conservancy

Ravenswood Bay Trail Connection
Karine Tokatlian, Midpeninsula Regional Open Space District

“Coastal Science Allies” Champion Research, Stewardship, and Education Focused on Building Resilience and Collaboration to Enhance the San Francisco Estuary
Michael Vasey, SF Bay NERR | Estuary & Ocean Science Center, SFSU

Sediment

The Effects of Abiotic and Biotic Factors on the Decomposition Rates of Dominant Plant Species in Sacramento-San Joaquin Delta
Mishal Durrani, UC Berkeley

Update of Erosion and Deposition in San Francisco Bay
Theresa Fregoso, USGS

Inferring Sediment Transport Pathways and Fluxes from Bathymetric Change
Bruce Jaffe, USGS

Towards Embayment-Scale Sediment Flux Measurements in San Francisco Bay
Daniel Livsey, USGS

SediMatch: Match Available Sediment with Opportunities for Beneficial Reuse
Sandra Scoggin, SFBJV

Using LiDAR to Examine Soil Subsidence and Accretion in Sac/SJ Delta
Robert Shortt, UC Berkeley*

Trends in Benthic Sediments in San Pablo and Grizzly Bays
Lukas WinklerPrins, UC Berkeley | USGS*

Species and Communities

Species and Communities – Aquatic

Pinole Creek Fish Passage Project
Lisa Anich, Contra Costa RCD

Epifaunal Community Recovery in San Francisco Estuary Eelgrass (*Zostera marina*) Beds After Extended Low Salinity

Geana Ayala, Estuary & Ocean Science Center, SFSU*

Long-Term Trends of Dungeness Crab (*Cancer magister*) Population Dynamics in the San Francisco Estuary
Emily Campbell, CDFW

Temporal Patterns in Richness and Relative Abundance for Early Life Stages of Fishes in the Upper San Francisco Estuary
Gonzalo Castillo, USFWS

Modeling Fluvial Habitat Connectivity for Migratory Fish
Daniel Constable, Delta Stewardship Council

Critical Windows in Chinook Salmon Development: Differential Sensitivity to Warming and Hypoxia During Early Development
Annelise Del Rio, UC Davis*

The Value of a Non-Traditional Long-Term Data Set: Sampling at a Former Naval Dry Dock
Stewart DesMeules, WRA, Inc.

A Comprehensive Look at a Multi-Year Study Using Various Methodologies to Capture Endangered Delta Smelt
Kate Erly, USFWS

Stream Temperature in Lagunitas and Walker Creek Watersheds
Emma Goodwin, SF Bay Water Board

Occupancy Modeling to Examine
Imperiled Delta Smelt Habitat Use
Catherine Johnston, USFWS

Recent High-Resolution Eelgrass
Mapping with Side-Scan Sonar and
Visual Ground Truth by Local Scientists,
in Variable Central San Francisco Bay
*Christopher Kitting, CSU East Bay |
Alluvion Environmental Consulting*

How the Enhanced Delta Smelt
Monitoring (EDSM) Survey Can Improve
Juvenile Chinook Salmon Monitoring in
the San Francisco Estuary
Brian Mahardja, USFWS

20+ Years of Fisheries Restoration in
the Alameda Creek Watershed
Jeff Miller, Alameda Creek Alliance
Western Pond Turtle Movement and
Habitat Use in Suisun Marsh
Melissa Riley, CDFW | UC Davis*

Sink or Swim: The Risks and Rewards of
the Pescadero Intermittent
Estuary/Coastal Marsh Complex for
Threatened Central California Coast
Steelhead
Pat Samuel, California Trout

Habitat Assessment Using Acoustic
Telemetry
*Maggie Watts-Peterson, HTI-Vemco
USA, Inc. part of Innovasea*

Species and Communities – Avian

Managing the Suisun Marsh for
Waterfowl and Fish
Cliff Feldheim, CDWR

Behavioral Response of Waterbirds to
Large-Scale Watercraft Disturbance in
San Francisco Bay
Tanya Graham, USGS

Breeding Waterbirds in San Francisco
Bay: How Have Populations Changed
Over the Past 18 Years?
C. Alex Hartman, USGS

Wetland Availability and Quality for
Ducklings in Suisun Marsh
C. Alex Hartman, USGS

Seasonal and Annual Variation in Body
Condition Among Four Diving Duck
Species Wintering in the San Francisco
Bay
Mason Hill, USGS | UC Davis

Diet and Nesting Trends of Two
Sympatric Terns Breeding in the San
Francisco Bay
David Riensche, EBRPD

Water Quality

Long-Term Water-Quality Monitoring in
San Francisco Estuary: Effects of
Varying Freshwater Inflow and Other
Factors on Estuary Water Quality
Maureen Downing-Kunz, USGS

Selenium Loads from Palo Alto Creeks
to the Lower South Bay
*Diego Martinez Garcia, City of Palo
Alto*

Water Quality - Stormwater Runoff

Bioswale Trees: Tree Growth and Soil Conditions in Bioswales Over a 5-Year Period

Igor Lacan, UC Cooperative Extension

An Integrated Approach for Estimating Directly Connected Impervious Areas in Ungauged Basins

Anneliese Sytsma, UC Berkeley*

Water Quality - TMDL Implementation

Development of Dissolved Oxygen Criteria in Suisun Marsh

Sujoy Roy, Tetra Tech Inc.

Testing Managed Wetlands BMPs for Improving Water Quality and Achieving TMDL Objectives in Suisun Marsh

Stuart Siegel, SF Bay NERR

Water Quality - Emerging Contaminants

Evaluation of Automated Raman Analysis for Monitoring Microplastics in Environmental Samples from the San Francisco Estuary

Jackelyn Lang, UC Davis

The Effects of Copper Exposure on the Olfactory Organ of Delta Smelts: From Tissues to Behavior

Pedro Alejandro Triana Garcia, UC Davis*

Water Quality - Nutrients

Bottom-up Controls on Phytoplankton Community Composition in Lower South Bay

Jaylyn Babitch, City of San Jose

Oral Toxicity of Purified Microcystin - LR in Mallards

Yih Tyng Bong, UC Davis*

Using High Frequency Observations to Characterize Spatial Variability in Nutrients and Phytoplankton Production in San Francisco Bay

Ariella Chelsky, SFEI

Monitoring Benthic Invertebrate near treated Wastewater Discharge in the Lower South Bay

Ryan Mayfield, City of San Jose

Nitrification Rates in South San Francisco Bay

Anna Rasmussen, Stanford University*

Exploring Methods to Study Nitrifiers in South San Francisco Bay

Benji Reade Malagueño, Stanford University*

A Conceptual Model for the Transport of *Microcystis aeruginosa* and microcystin Between Water, Sediments, and Bivalves in the San Francisco Estuary

Jenna Rinde, University of San Francisco*

Constituent Fluxes of Chlorophyll-a and Nitrate from a Shallow Shoal in San Francisco Bay

Elizabeth Stumpner, USGS

The Response of Phytoplankton Productivity to Agricultural Flow Releases in the North Delta
Frances Wilkerson, Estuary & Ocean Science Center, SFSU

Water Quality - Trash

From Trash to Data: Using Bycatch to Gain Insight into Trash Trends
Emma Davidson, USFWS

Review of the Sacramento-San Joaquin Delta Conservancy's Efforts on Trash Clean-Ups in the Delta
Brian N. Keegan, Sacramento-San Joaquin Delta Conservancy*

A New Map of Oakland's Creeks
Mike Perlmutter, City of Oakland

Trash Management in Oakland
Jennifer Stern, City of Oakland

Illegal Dumping Removal and Prevention from Contra Costa Agricultural Lands
Ben Weise, Contra Costa RCD

Watershed Management

Delta Science Plan 2019: Vision, Principles, and Approaches for Integrating and Coordinating Science in The Delta
Yumiko Henneberry, Delta Science Program

Water Management in Suisun Marsh Controls Resilience to Fire Disturbance
Scott Jones, USGS

Fine-scale Update to the Vegetation and Land Use Classification and Map of the Sacramento-San Joaquin River Delta
Ron Melcer, Delta Stewardship Council

Conserving Watersheds and Riparian Networks from Headwaters to the Estuary: The Bay Area Conservation Lands Network 2.0 Science Expansion
Tom Robinson, Bay Area Open Space Council